VIRTUAL WORLDS
HOW INCREASING COMPLEXITY WILL MAKE THINGS SIMPLER

MEDIA, TECHNOLOGY, INDUSTRY
21ST APRIL 2005

PROF. RICHARD A. **BARTLE**
UNIVERSITY OF **ESSEX**, UK

- THIS IS A TALK ABOUT ONE POSSIBLE **FUTURE** OF VIRTUAL WORLDS
- IT'S ALL VERY **SPECULATIVE**
- **NONE** OF WHAT I DESCRIBE LATER ON IS IMPLEMENTED
- IT MAY NEVER **BE** IMPLEMENTED
- HOWEVER, IT'S MY CONTENTION THAT IT **SHOULD** BE IMPLEMENTED
- WHY? BECAUSE IT WOULD BE JUST **SO COOL** IF IT WERE!

- VIRTUAL WORLDS ARE **PLACES**
- BEING PLACES, THEY HAVE A NUMBER OF PLACE-LIKE **FEATURES**
  - YOU CAN **VISIT** THEM
  - **OTHER** PEOPLE CAN **ALSO** VISIT THEM
  - AT THE **SAME TIME**
- THEY ARE, HOWEVER, **NOT REAL**
- THIS SEEMS LIKE A MAJOR **DISADVANTAGE**
  - HOW DO YOU **VISIT** SOMETHING THAT **ISN'T REAL?**

ANSWER:

- YOU USE AN **AVATAR**

- FAR FROM ITS BEING A **DISADVANTAGE**, PEOPLE OFTEN **LIKE** USING AN AVATAR

- SOME PEOPLE **PREFER** IT TO REALITY

- THROUGH THEIR AVATARS, PLAYERS OFTEN ENJOY **INTERACTING WITH** EACH OTHER

- THEY **DON'T** SO OFTEN ENJOY BEING **ACTED ON** BY EACH OTHER...

IN ADDITION

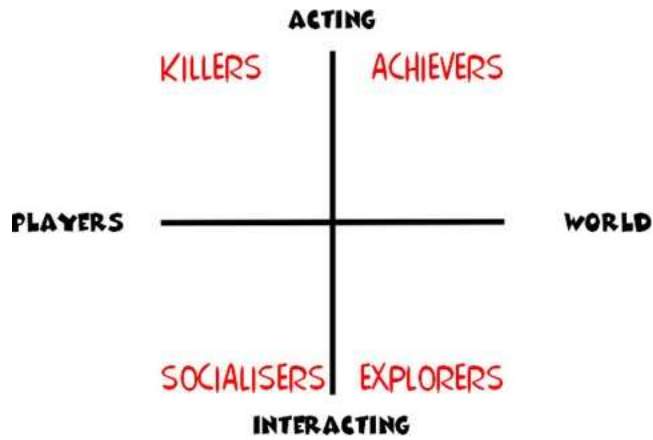- MOST PLAYERS REGARD VIRTUAL WORLDS AS BEING BASICALLY **GAMES**

BUT OTHERS

- BUT OTHER PEOPLE JUST LIKE THE **THRILL** OF EXPLORING SOMEWHERE **NEW**

- PEOPLE HAVE *different* IDEAS AS TO WHAT MAKES A GOOD VIRTUAL WORLD

- HOW DO YOU FIND THE VIRTUAL WORLD THAT SUITS YOU **BEST**?

- YOU CREATE YOUR **OWN** VIRTUAL WORLD!

- (YOU NOTICED THERE WAS NO PICTURE HERE, RIGHT?)

ADVANTAGE

- BECAUSE THEY'RE NOT REAL, VIRTUAL WORLDS ARE COMPARATIVELY **INEXPENSIVE** TO MAKE

GREAT PYRAMID OF CHEOPS
GIZA, EGYPT
COST TO BUILD TODAY:
$1,000,000,000

MONUMENT OF ARCHITECTURE
"A TALE IN THE DESERT"
COST TO BUILD TODAY:
$1,000,000

7

- VIRTUAL WORLDS **USED** TO LOOK LIKE THIS

```
Narrow road between lands.
You are stood on a narrow road between The Land and whence you came.
To the north and south are the small foothills of a pair of majestic
mountains, with a large wall running round. To the west the road
continues, where in the distance you can see a thatched cottage
opposite an ancient cemetery. The way out is to the east, where a
shroud of mist covers the secret pass by which you entered The
Land. It is raining.
*w
Narrow road.
You are on a narrow east-west road with a forest to the north and
Gorse scrub to the south. It is raining. A splendid necklace lies
on the ground.
*
```

- ONE PERSON WORKING ALONE COULD WRITE A SUCH WORLD

- THEN THEY STARTED LOOKING LIKE THIS

```
[ ][ ][ ][ ]- -[ ] orc  sword  shield  chain
[ ] A         S [ ] A Jennie.c
/   >   ++++   [ ] A 2 skeletons
[ ]     ++++   [ ] B trolls
[ ] B       dn [ ]
[ ][ ][ ][ ][ ][ ]

Swing hits with moderate damage
Skeleton is slain
Orc is blocked by your armour
Troll: kia ardata luuppatar ne

>throw bottle at troll
R mace   Hits      Hits On   Stamina   Exper. M. Pnts.
L bottle   35       5         10        6523   9
```

- THEN LIKE THIS

- THEN LIKE THIS

- NOW, THEY LOOK LIKE THIS

UNFORTUNATELY

- IT COST SOMETHING LIKE **$30M** TO DEVELOP *WORLD OF WARCRAFT*
  - I'VE SEEN ESTIMATES BETWEEN $25M AND $70M
- IT COST **$20M** TO DEVELOP *EVERQUEST II*
  - "MONEY WELL SPENT" OR "MONEY, WELL, SPENT"?
- MOST OF THE DEVELOPMENT COSTS GO ON ARTWORK AND CONTENT
- LET'S SUPPOSE FOR A MOMENT THAT THIS IS **IRRELEVANT**, THOUGH
- WHAT WOULD IT TAKE FOR **ANYONE** TO BE ABLE TO CREATE THEIR **OWN** VIRTUAL WORLD?

- THEY'D NEED:
  - A **COMPUTER**
  - AN **INTERNET** CONNECTION
  - SOME **CLIENT** SOFTWARE
  - SOME **SERVER** SOFTWARE
  - A **PROTOCOL**
- THEY'D ALSO NEED AN **IMAGINATION**, SOME **TIME** AND A **REASON** TO DO IT
  - SOME **PLAYERS** WOULD BE NICE, TOO...

- WE CAN ASSUME THEY ALREADY **HAVE** A COMPUTER AND AN INTERNET CONNECTION
- BUT **WAIT**! DON'T THEY NEED **TWO** COMPUTERS?
  - ONE FOR THE SERVER
  - ONE FOR THE CLIENT (WHEN THEY'RE PLAYING)
- NO, THEY DON'T. TO SEE **WHY NOT**, LET'S LOOK AT POSSIBLE **ARCHITECTURES** FOR VIRTUAL WORLDS
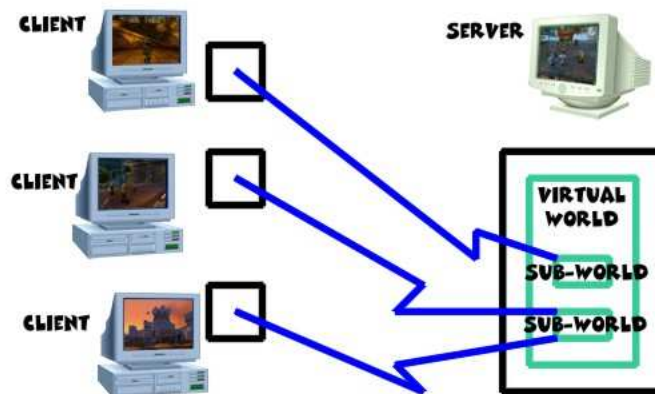
ARCHITECTURES 1

- CLASSIC CLIENT/SERVER ARCHITECTURE, EG. *WOW*
 - (ACTUALLY, MULTIPLE SERVERS USING 5-10 COMPUTERS EACH)

CLIENT

CLIENT

CLIENT

SERVER
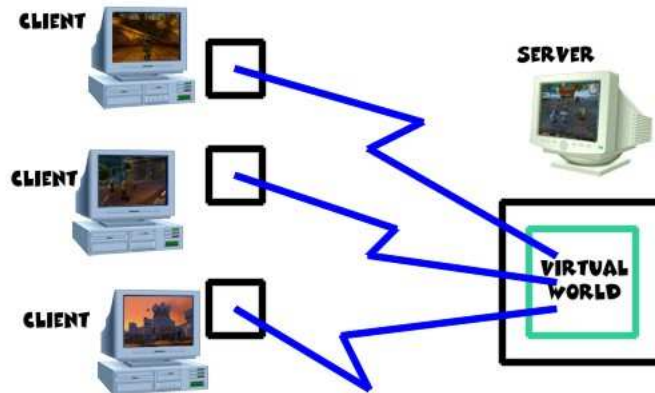
VIRTUAL WORLD

ARCHITECTURES 2

- SUB-WORLD HOSTING, EG. *SECOND LIFE*
  - (ONE SERVER USING SEVERAL HUNDRED COMPUTERS)

CLIENT

CLIENT

CLIENT

SERVER

VIRTUAL WORLD

SUB-WORLD

SUB-WORLD

12

ARCHITECTURES 3
- INDEPENDENT VIRTUAL WORLD HOSTING (EG. TEXT MUDS)

CLIENT
SERVER
VIRTUAL WORLD
VIRTUAL WORLD
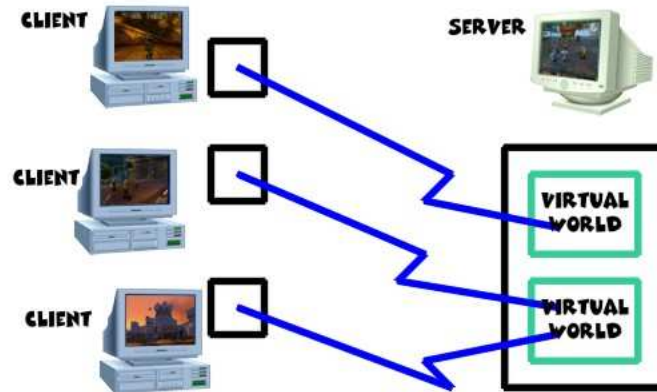
ARCHITECTURES 4
- DISTRIBUTED SYSTEM
- MANY COMPUTERS, MANY VIRTUAL WORLDS

CLIENT
CLIENT
CLIENT
CLIENT
CLIENT
CLIENT
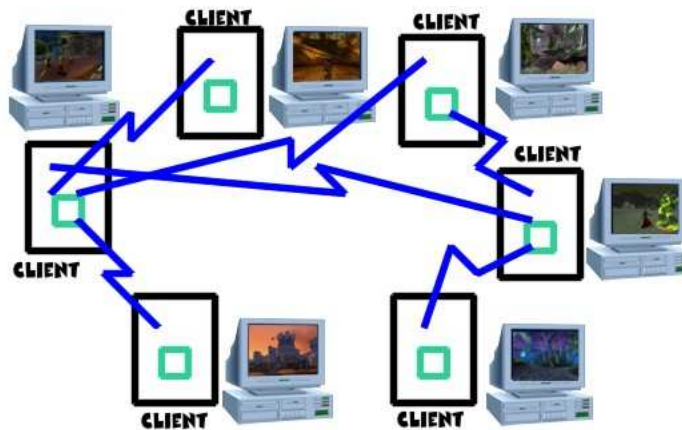
- IN A **DISTRIBUTED** SYSTEM, EVERY COMPUTER CAN RUN **BOTH** THE CLIENT SOFTWARE **AND** THE SERVER SOFTWARE
  - INDEED THE CLIENT SOFTWARE MAY **BE** THE SERVER SOFTWARE
- THIS IS A **LOT** MORE COMPLICATED THAN A CLASSICAL SERVER FARM
  - OTHER COMPUTERS CAN'T BE **TRUSTED**!
  - HOW TO PASS THINGS **BETWEEN** SERVERS?
  - WHAT IF ONE OF THE COMPUTERS FAILS?!
- BUT GUESS WHAT? **NONE OF THIS MATTERS!**

- THIS **ISN'T** FOR LARGE-SCALE, COMMERCIAL VIRTUAL WORLDS
  - ALTHOUGH IT **CAN** BE USED FOR THEM
- THIS IS FOR SMALL-SCALE, **PERSONAL** VIRTUAL WORLDS
- YOU **CAN** LINK TO OTHER VIRTUAL WORLDS IF YOU WANT TO
- YOU PROBABLY **WON'T** WANT TO **INTEGRATE** TWO WORLDS TOGETHER, THOUGH
- DOES THIS SEEM AT ALL **FAMILIAR**..?

WORLD WIDE WORLD WEB

- THIS IS HOW THE **WORLD WIDE WEB** WORKS
- **THOUSANDS OF MILLIONS** OF WEB PAGES
  - OF varying quality,
  - **HYPERLINKED** TOGETHER
- AT ANY ONE MOMENT, YOU CAN BE BROWSING **SEVERAL** WEB SITES IN DIFFERENT WINDOWS
- **OTHER** PEOPLE CAN BE BROWSING **YOUR** WEB SITE
- WE CAN HAVE THE **SAME THING** FOR VIRTUAL WORLDS
- EXCEPT, VIRTUAL WORLDS ARE **INTERACTIVE**

INTERACTION

- AGAIN, **SO WHAT?**
- **INSTANT MESSENGER** IS INTERACTIVE, BUT **MILLIONS** OF PEOPLE USE IT
  - NOTE: I'M NOT ONE OF THEM!
- IMAGINE IF, INSTEAD OF AN **IM** WINDOW, YOU HAD A **VW** WINDOW
  - A VIRTUAL WORLD **YOU** COULD CREATE YOURSELF
  - THAT **YOU** COULD DECIDE WHO ENTERS
  - THAT CAN HAVE EXITS TO **OTHER** VIRTUAL WORLDS
  - THAT YOU CAN RUN **MULTIPLE** COPIES OF
- ALL ON YOUR **OWN COMPUTER**

- **THIS** IS WHAT I WANT
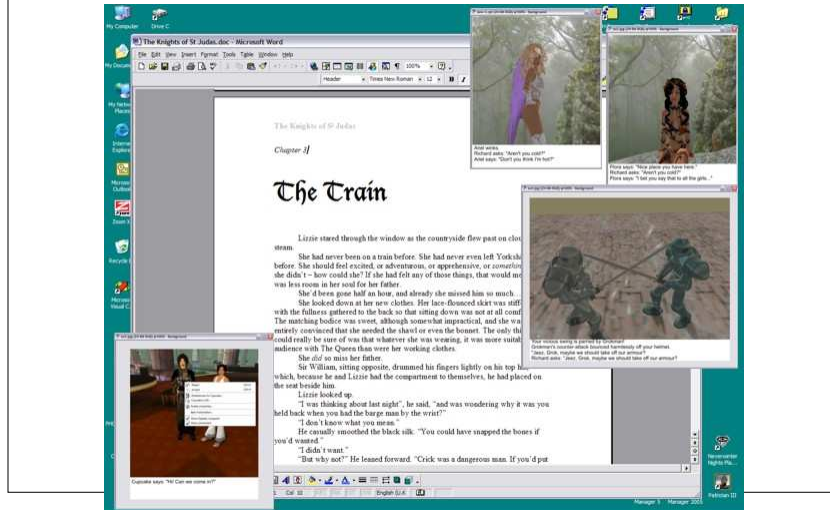
DETAILS...

- HOW WOULD THIS WORK?
- YOU'D START YOUR VIRTUAL WORLD UP WHEN YOU WANTED TO **RECEIVE** CONNECTIONS
- PEOPLE ON YOUR BUDDY LIST COULD GET IN **WITHOUT ASKING**
- WHETHER **OTHER** PEOPLE GET IN DEPENDS ON WHETHER YOU WANT TO ACCEPT **UNSOLICITED** ENTRANTS OR NOT
  - EG. **FRIEND** OF A **FRIEND** MAY BE OK
  - EG. YES, IF THEY GIVE YOU **$1** VIA **PAYPAL** FIRST
  - EG. YES IF THEY'RE A MEMBER OF YOUR **GUILD**

- YOUR PERSONAL VW COULD HANDLE **SEVERAL** INSTANTIATIONS OF ITSELF
  - HOLD A **PARTY** IN ONE INSTANTIATION
  - SPEAK TO YOUR **LOSER FRIEND** IN ANOTHER
- YOU COULD HAVE **MORE THAN ONE** VW RUNNING **SIMULTANEOUSLY**
- VW **ONLY** RUNS WHEN YOUR **PC** IS RUNNING
  - LIKE INSTANT MESSENGER
  - BUT YOU **COULD** USE A HOSTING SERVICE IF YOU WANT IT RUNNING 24/7
- CONTAINS **DOORS** TO OTHER VWS (OR WEB PAGES)

- YOU CAN **ALSO** VISIT VWS OWNED BY OTHER PEOPLE
- CRANK UP YOUR CLIENT
- TYPE IN THEIR **WWWW** ADDRESS
  - OR USE FAVOURITES, SEARCH ENGINE, HYPERLINK...
- IF THEIR PC ISN'T RUNNING, **TOUGH LUCK**
- IF YOU PASS THEIR AUTOMATIC **ACCEPTANCE** CRITERIA, YOU'RE **IN**
- IF YOU PASS THEIR AUTOMATIC **REJECTION** CRITERIA, YOU'RE **OUT**
- OTHERWISE, THEY'LL DECIDE **THERE AND THEN**

BRINGING STUFF

- YOU MAY OR MAY NOT BE ABLE TO BRING ONE OF YOUR OWN AVATARS WITH YOU
  - DEPENDS ON ITS **MODEL** (EG. NUMBER OF POLYGONS)
  - DEPENDS ON THE **VW** (EG. FANTASY WORLD)
- **YOU** CAN ALWAYS DISPLAY IT HOW YOU LIKE
  - IT'S JUST **OTHER** PEOPLE WON'T SEE IT...
- THE SAME APPLIES TO **OBJECTS**
- SYSTEM OF **DIGITAL CERTIFICATES** TO GUARANTEE OBJECTS CONFORM TO **STANDARDS**
  - NO SUSPECT **FUNCTIONALITY**

MULTIPLE ME

- YOU CAN BE VISITING **SEVERAL** WORLDS AT THE SAME TIME
  - INCLUDING ONES ON YOUR **OWN** PC
- IT DOESN'T MATTER IF YOUR AVATAR IS **DAMAGED** OR **DESTROYED** IN ONE OF THESE VWS
  - THEY JUST USE **COPIES**
  - IT'S ONLY DEAD IN THAT **ONE** VIRTUAL WORLD, AND EVEN **THEN** IT MAY NOT BE **PERMANENT**
- WHETHER YOU CAN TAKE AN ITEM **INTO** OR **OUT OF** A VIRTUAL WORLD IS UP TO THE VW'S **OWNER**
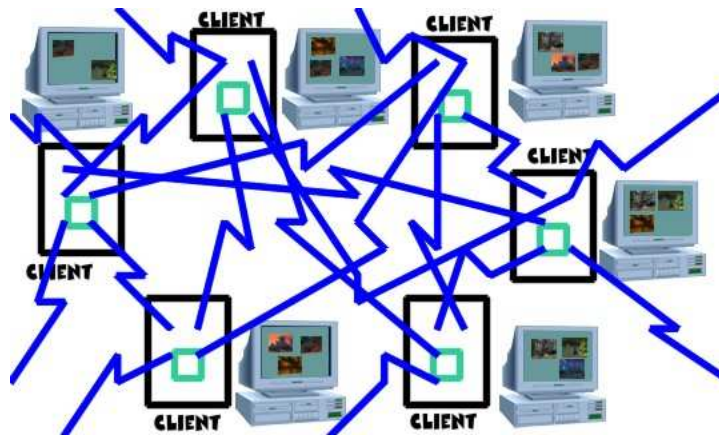 - YOU'RE ONLY TAKING A **COPY** ANYWAY!

- SO THE EARLIER PICTURE I SHOWED THAT LOOKED LIKE THIS
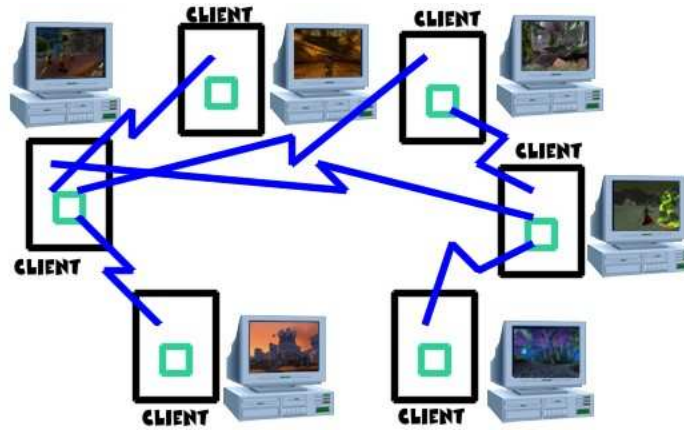
- ACTUALLY LOOKS MORE LIKE THIS

- LET'S RETURN TO THE EARLIER ISSUES I BREEZILY **WAVED ASIDE**
- FIRSTLY, ISN'T THIS GOING TO COST A **FORTUNE** TO DEVELOP?
- THE WWWW PROTOCOL **STANDARD**, NO
  - IT REQUIRES **CAREFUL THOUGHT**, BUT WE'RE NOT TALKING MASSIVE COMPLEXITY HERE
- THE **SOFTWARE**, ALSO PROBABLY **NOT**
  - IT'S THE KIND OF THING A SMALL GROUP OF CAPABLE **STUDENTS** COULD WRITE IT IN A YEAR
- THE **ARTWORK**..?

- *THE SIMS 2*
  - THERE WERE **18K+** CLOTHES ON THE SITE THESE CAME FROM

- MANY USERS ACTUALLY **LIKE** CREATING THIS STUFF
  - THEY SPEND **HOURS** ON IT
- THEY **SHARE** IT WITH THEIR **FRIENDS**
- THE BETTER ONES **CHARGE** FOR THEIR WORK
- WE ALREADY SEE IT IN *SECOND LIFE* AND *THERE*
- MIGHT POOR QUALITY BE A PROBLEM?
- FOR PROFESSIONAL GAME-LIKE VIRTUAL WORLDS YOU **PAY** A **SUBSCRIPTION** FOR, **YES**, IT WOULD BE
- FOR A WORLD ONLY MEANT FOR **YOU** AND YOUR **FRIENDS**, IT'S JUST LIKE AN AMATEUR **WEB** SITE

WHY MAKE ONE?

- WHY WOULD A COMPANY DEVELOP THE **SOFTWARE** FOR SUCH A SYSTEM?
- WOULDN'T IT HAVE TO BE **FREE**?
- YES, IT **WOULD** HAVE TO BE FREE
- HOWEVER:
  - THE **DEVELOPMENT TOOLS** DON'T HAVE TO BE FREE
    - EVERYONE CAN **READ** .PDF FILES, BUT TO WRITE ONE YOU **PAY**
  - THERE'S MONEY TO BE MADE **SELLING** AVATARS, CLOTHES, OBJECTS, ROOMS, FUNCTIONALITY, MUSIC, HAIRSTYLES, ...
- I **DON'T** EXPECT A COMPANY TO DEVELOP THIS THOUGH
  - A **UNIVERSITY**, HOWEVER?

- THERE **IS** SOME MOVEMENT IN THIS DIRECTION
- *SECOND LIFE* HAS MUCH OF THE FUNCTIONALITY BUT PUTS EVERYONE IN THE **SAME** VIRTUAL WORLD
  - AND ITS VIRTUAL REAL ESTATE IS **EXPENSIVE**

IMVU

- A GRAPHICAL ADD-ON TO **INSTANT MESSENGER**
  - ONLY GET ONE ROOM, CAN'T MOVE AROUND
  - CHARGES FOR USE
  - SERVER-BASED, CAN ONLY USE THEIR MODELS

VRML

- VRML LETS YOU **CREATE** THE WORLDS
  - **NOT** DESIGNED FOR REAL-TIME ANIMATION
    - ASSUMES RELATIVELY **DUMB** CLIENT
  - ONLY AN **INTERFACE**, NOT A VIRTUAL WORLD **ENGINE**
    - WORLDS ARE BY DEFAULT **SINGLE-USER**

CONCLUSION

- SO WE'RE GETTING **CLOSER**
- WILL WE EVER **ARRIVE**, THOUGH?
- **I'D** LOVE TO SEE THIS HAPPEN
  - BUT THEN I **WOULD**, WOULDN'T I?
- IS IT SOMETHING THE **PUBLIC** WOULD WANT?
- IS IT SOMETHING THEY'D **STILL** WANT, **5 YEARS LATER**?
- IS IT SOMETHING **YOU** LIKE THE IDEA OF?
- EVERYONE'S AN EXPERT...